

# THE BRITISH COLUMBIA COMMITTEE ON THE UNDERGRADUATE PROGRAM IN MATHEMATICS AND STATISTICS

MINUTES OF THE 84<sup>th</sup> MEETING, MAY 16 - 18, 2006

TUESDAY, MAY 16, 2006

## 1. WELCOME

Gary MacGillivray, Chair of the Mathematics Department at the University of Victoria welcomed the BCcupms to its 84<sup>th</sup> meeting.

## 2. ADOPTION OF THE AGENDA FOR THE 84<sup>TH</sup> MEETING OF THE BCcupms

The Agenda for the 84<sup>th</sup> Meeting was approved by consensus with the following additions to Wednesday's Agenda under New Business: 5.4 Math Contest—Clint Lee, and 5.5 Numbers of Math Majors.

## 3. ADOPTION OF THE MINUTES OF THE 83<sup>RD</sup> MEETING, HELD AT NWCC IN PRINCE RUPERT

The Minutes of the 83<sup>rd</sup> Meeting were approved by consensus as posted on the BCcupms Website.

## 4. ANNOUNCEMENTS

**4.1 Notice of Elections:** At this meeting, elections for Chair of the Statistics Subcommittee and for Chair of the BCcupms will be held. These positions have two-year terms. Kevin Keen and Susan Chen volunteered to coordinate nominations for the Chair of the Statistics Subcommittee, while Jim Bailey, Leo Neufeld, and Nora Franzova coordinate nominations for the Chair of the BCcupms.

**4.2 Conferences:** Malgorzata Dubiel reminded the group about the Joint CMS Education Sessions/CMESG meeting that will take place in Calgary from June 3 to June 7.

**4.3 Attendance Lists:** Jim Bailey circulated the attendance lists.

**4.4 Announcements from the host, Gary MacGillivray:** Gary made the usual host announcements regarding places to eat on campus, information on computer access and the location of the afternoon wine and cheese reception.

## 5. ADDRESS: "Upcoming Changes to the K-12 Mathematics Curriculum"—Richard DeMerchant, Ministry of Education

Richard described the current status of curriculum development and revision. He began by reviewing a number of the studies that had been undertaken to inform the most recent set of proposed changes, including *The WNCP Mathematics Research Project: Final Report* (available on-line at: [http://www.wncp.ca/math/Final\\_Report.pdf](http://www.wncp.ca/math/Final_Report.pdf)), *The WNCP Reference List* (available on-line at: <http://www.wncp.ca/math/reference.pdf> and in the revised WNCP K-9 CCF), *The Consultation Draft for the Common Curriculum Framework Kindergarten to Grade 9 Mathematics Final Analysis Report*, *High School Mathematics: What British Columbia Post-Secondary Institutions Want Our Students to Know* (available upon request), and *Western and Northern Canadian Protocol (WNCP) Consultation with Post-Secondary Institutions, Business and Industry Regarding Their Requirements for High School Mathematics: Final Report on Findings* (available upon request; to be posted on [www.wncp.ca](http://www.wncp.ca)). He then described a number of initiatives that are underway.

All three streams of the Math 10 – 12 curriculum are being refined to address immediate concerns about the clarity of Prescribed Learning Outcomes and content overload, and to introduce Suggested Achievement Indicators. Conics, Statistics and Financial Math have been removed from the Principles of Math 12 course. A "Final Draft" version of these documents will be posted on-line at <http://www.bced.gov.bc.ca/irp/drafts/> as soon as possible. Teachers will be implementing these changes in Grade 11 for September 2006 and in Grades 10-12 by September 2007. The final version of the revised IRPs will be posted on-line at [http://www.bced.gov.bc.ca/irp/irp\\_math.htm](http://www.bced.gov.bc.ca/irp/irp_math.htm).

The WNCP CCF for K-9 Mathematics is currently in the last stages of editing and translation into French. It is anticipated that the final document will be signed-off and posted at [www.wncp.ca](http://www.wncp.ca) in June 2006. This document will be the basis for the BC K-7 and 8-9 IRPs.

The BC writing team is currently working with the WNCIP K-9 CCF Publishers' Draft to develop the BC IRP. Outcomes and Achievement Indicators will be the same as the WNCIP CCF. The majority of the work is in relation to the Classroom Assessment Model. Mathematical Process will be included in the BC IRP.

A BC writing team will be struck to start work on the Grades 8 and 9 IRP. Timelines for this work have not been finalized. Since the Prescribed Learning Outcomes and Achievement Indicators will be the same as those found in the WNCIP K-9 CCF teachers will be able to begin their preparation for implementation as soon as the WNCIP K-9 CCF is finalized.

A new structure has been proposed for the new WNCIP Math 10 – 12 programme. This new structure has two courses at the grade 10 level, one for trades/occupational math and the other for students going on to either the calculus-based or non-calculus-based pathways at the grade 11 level. Grade 11 and Grade 12 each offer three courses: trades/occupational, non-calculus-based, or calculus-based. There is no opportunity for students to move from the trades/occupational pathway to the other pathways, however a student could use either of the grade 11 courses (calculus-based or non-calculus-based) in order to transition to the other pathway for Grade 12. The content in the calculus-based pathway and the non-calculus-based pathway will be different. A student could opt to take all four courses.

The implementation schedule for changes can be found at [http://www.bced.gov.bc.ca/irp/implement\\_sched.pdf](http://www.bced.gov.bc.ca/irp/implement_sched.pdf) . The new curriculum will not be fully implemented until 2012.

Discussion followed. It was noted that currently the vast majority of students are choosing the Principles of Math pathway. The revisions themselves will not change this. Several representatives of the Ministry asked the members of the BCcupms to help support acceptance of the other pathways for admission to programmes at their respective institutions.

It was also noted that the fact that most students opt to take Principles of Math means that there are a number of students who are not strong in mathematics who are taking this course. This contributes to the sense of content overload in these courses. Other options for addressing the content overload issues were put forward including: adding additional hours of Math, or providing a single stream for everyone but offering additional math courses for those going on.

Malgorzata Dubiel expressed concern about the outcomes that are chosen for each pathway. Investigations into what mathematics is required for various programmes at SFU revealed that when individuals are surveyed about what math they need/use they often leave a great deal out. The math that they use is taken for granted. Simon Fraser University will be posting their own list of expectations.

Richard Atkins asked whether research into how BC students perform compared to students in other countries has influenced the new proposal. Richard DeMerchant noted that there has been a significant shift in the North American focus. Formerly the curriculum tried to address the full gamut of math topics in early years, but now will focus primarily on number and space/shape. Comparisons with other countries are difficult since they are also undergoing changes. As well, other countries do discriminatory testing early, and there is little interest in pursuing this here.

Kevin Keen expressed his approval for the removal of Statistics from the PM12 curriculum. A consequence of this will be that post-secondary institutions will need to require all students to take a Statistics course in their first year to ensure that their education includes Statistics.

Appreciation for the information provided and for the consultative approach that has been used in the development of the latest revisions was expressed. Richard DeMerchant encouraged the members to continue to provide him with feedback on the proposed changes.

## **6. MATHEMATICS AND STATISTICS SUBCOMMITTEE SESSIONS: (held concurrently)**

### **MATHEMATICS SESSION**

#### **Math1. Teaching first-year calculus: reacting to changes in students' preparation—Malgorzata Dubiel**

Malgorzata opened the discussion by describing SFU's most recent response to the perceived underpreparation of students entering Calculus at the university. SFU used to require a B or better in PM12, or Math 100(Precalc), or an assessment test score for entry into Calculus. She noted that the Precalc is not Math 12: it has no stats or conics, but it has some current Math 11 topics. (Conics were recently abandoned to allow more time for the other topics.)

Formerly students with a C- in Math 11 were permitted to take this course. Largely because of the big range of students, the course was not effective in preparing students for calculus. Now with SFU's new Math entry requirements, weaker students will not be in the Math 100 course.

Malgorzata noted that post-secondary institutions can't keep waiting for schools to change. We need to find ways to adapt to the current level of preparation of incoming students. SFU has recently undertaken several research projects in order to determine what these needs are. They have found that the best predictor of success in university calculus is having taken highschool calculus. In response to this, and following UBC's example, SFU has introduced Math 150, a new first semester calculus course with an extra credit hour that emphasizes more precalculus material. This course is recommended for students who have not taken calculus before. There is a need to lobby other departments to accept this new course. Only 10 – 12% of students have highschool calculus. This new course doesn't quite address the whole issue. The first-year Calculus course is overloaded with topics and this is difficult to change. There is a Departmental Task force looking at Calculus issues in general, including concerns about homework (there are concerns about cheating), and calculator use (students can use calculators in schools, but the university can't allow electronics in exams with 400 students).

Another predictor of success in Calculus is grades in PM11 and PM12. Students with less than a B in PM11 do not do well. Also students with a low B in PM12 do not do well. In response to this the Mathematics Department wanted to change the grade for entry into Calculus to 75% from the current 70%. Computer system restrictions forced them to choose between an 80% cut off or a 73% cut off. They have opted for the 73% for this academic year. Also under consideration is the option of offering different variations of Calculus for students with different backgrounds, as well as the possibility of having different prerequisites for the different first-year calculus courses that they currently offer.

A survey of members in the room indicated that 6 institutions allow students into Calculus with less than a B; 10 require a B. One college requires a B+ (75%). Capilano requires an A in Math 12 or a B in both Math 12 and Calculus 12. The following motion was formulated.

**Motion:** (moved by Ian Bailey and seconded by Slava Simice)

**Given that recent studies show that students with less than a B are often not successful in calculus, the BCcupms believes that a B grade in PM 12 or equivalent should be the minimum grade for entry to calculus.**

**Carried without dissent.**

It was felt that this was just a start at addressing the problems of calculus success rates. Other issues that need to be considered include:

- Core competencies: do we need to cover as much material as we do? To a large extent the content is driven by the demands of other areas like Physics and Business. There was some debate on the value/appropriateness of covering epsilon-delta proofs in the first Calculus course. A review of core competencies needs to be done over the next year. This will be discussed tomorrow. Richard DeMerchant noted that it would be useful if this review could be done in time to influence the current curriculum revisions.
- Hours of instruction and pacing: highschool students get roughly 100 hours for Calculus, while colleges and universities cover the same material in 36 – 40.
- Student mindsets: Students are generally caught by surprise by the deeper level of understanding that is required for Calculus. Many are not used to doing homework. Warnings that things will be different in Calculus seem to make little difference. Suggestions for how to deal with this included: offering 1-credit university Math-prep courses, or giving frequent quizzes so students are aware early on if their study methods aren't effective. Robert Sidley noted that the goal of highschool students is to get into university—they don't seem to care how they do once they get there.
- Transfer of knowledge between courses (i.e. physics and math) also seems to be lacking. There was speculation on why this might be the case: students may not see the math taught in math class as useful; they may not be getting enough applied examples. Coordinated Science programmes try to address this.
- The quality of students: With the increased need for university level education for employment, parents are pushing students even when they may not be suited for university studies. There seems to have been a general shift world-wide towards greater access to universities. Mathematics departments have responded to this by adding remedial courses and/or additional hours, and offering alternative "flavours" of calculus.

- Algebra skills: The weakness in student algebra skills is being addressed in the latest curriculum revisions.

### **Math2. Students with C- in Principles of Math 11: what happens to them at your institution?—Wayne Matthews**

Wayne opened the discussion by noting that Math 10 marks are now on transcripts, and that we may now need to pay attention to the content of this course. Students have access to “Grade 11” at Camosun with a C+ in PM10, or a C- in PM11, or via ABE, or an Assessment/Interview.

Representatives reported on what happens to students who have a C- in PM 11 at their institution:

- North Island: must retake Math 11 (even with a C in Math 11)
- VCC: must take a two month, tuition free intro algebra course to prepare for Math 11
- Yukon: must take a diagnostic test which usually assigns them to a lower level course
- SFU: a minimum of 60% in Math 11 is required for university admission
- Douglas: may register in an algebra refresher course or take an assessment for advice
- Kwantlen: must take a “grade 10” course taught by ABE
- Camosun: must take an assessment test and are usually directed to Intro Algebra or ABE. The intro course is 4 weeks and is then followed by the Intermediate Algebra course.
- UCFV, Langara: must take a diagnostic test if they don’t want to take the advice given; anything below Math 12 is handled by ABE.
- OUC, Malaspina, North West: must go to ABE for diagnostic testing

Malgorzata Dubiel elaborated on SFU’s new entry requirements and new assessment test. Students with 60 – 70% in PM11 or PM12 are required to write a Q-assessment test. A sample test is ready but not yet on the web. If students pass they may take any course except Calc and a few others that have Math 12 requirements. A new 4-credit course called Quantitative and Analytical Reasoning has been developed for those who fail. Credits for this course do not count towards a degree. She noted that Grade 11 difficulties are not due to a lack of math skills, but rather a lack of math study skills. The course will focus on Math reasoning and study skills. Recently she and Peter Lillejedahl have experimented with beginning the Math for Teachers course with an emphasis on problem-solving and understanding. Other fundamental ideas, including fractions, can be picked up later on. For the new course they have requested class sizes of 40 for two hours of lecture per week, which will be split into to seminar groups of 20 for an additional two hours per week.

It was noted that the transition from Math 11 C to Precalc does not generally work well. This was followed by some discussion on whether assessment test results are being enforced. At several institutions the results are advisory. In these cases students often do not take the advice given. Several use their assessments to allow students to attempt to show they are in fact qualified for courses that they do not have the prerequisites for. At other institutions the results of the assessment are enforced, but students nonetheless often try to persuade instructors that their case is special.

### **Math3. Discrete mathematics courses—how are they faring?**

Several institutions reported serious declines in Discrete Math course enrollments including UCFV, Capilano, Douglas, Okanagan, Camosun and Coquitlam. This has been as a consequence of the decline in the number of Computing Science students over the last few years. There is some sense at Camosun that this may begin to improve.

At a number of institutions the teaching of the discrete math courses is shared between the Mathematics and Computing Science departments. At Okanagan College and Thompson Rivers University there is only one discrete math course offered at the second-year level which is cross-listed with the Computing Science department. It is required for computing science degrees. At TRU they are attempting to split this into two courses but there is disagreement over how this will be done.

In contrast, Finite Math courses seem to be doing well. Tim Topper reported that at Yukon College the finite math course is described in the calendar as an exposure to mathematical thinking for Arts students, and is recommended as a precursor to Statistics. As a result, enrollments have been very strong. At Camosun the Business Department requires one semester of calculus followed by one semester of finite math. This has strengthened their Finite Math

numbers. In contrast to this Nora Franzova reported that at Langara students who used to take the Finite Math course are now taking Math for Teachers, and as a result the Finite Math course is dying.

#### **STATISTICS SESSION**

- 1. Approval of Agenda**
- 2. Approval of Notes and Minutes of the Statistics Subcommittee from the 83<sup>rd</sup> meeting**
- 3. Articulation and Transfer Issues for Introductory Courses in Statistics**
  - (a) General items**
  - (b) Response from the Canadian Engineering Accreditation Board concerning requirements in introductory statistics courses for engineers**
- 4. Issues relating to Existing or Future Accredited Undergraduate Statistics Programmes**
  - (a) Changes in promotional criteria at UBC (Bruce Dunham, UBC)**
  - (b) Reports from other BC post-secondary institutions seeking accreditation from the Statistical Society of Canada**
- 5. Update on the Activities of Education Committee of the Statistical Society of Canada (Min Tsao, UVic)**
- 6. Information Items**
- 7. Recommendations for Future Articulation Meetings of Statistical Subcommittee and Changes to the Structure of the Statistics Subcommittee**
- 8. New Business**
- 9. Motion to Adjourn**

#### **7. REPORTS FROM MATHEMATICS AND STATISTICS SESSIONS**

##### **Mathematics Session**

Susan Milner reported on the Math session, in particular the motion that was passed.

**Motion:** (moved by Leo Neufeld and seconded by Wesley Snider)

**That the BCcupms endorse the motion regarding minimum requirements for entry into Calculus passed by the Mathematics Subcommittee.**

**Carried unanimously.**

It was noted that some institutions are struggling to raise their requirements for entry into Calculus. This motion is intended to support these institutions and may also send a message to school districts.

##### **Statistics Subcommittee Session**

Kevin Keen summarized the discussions of the Statistics Subcommittee.

#### **8. INSTITUTIONAL REPORTS, PART I**

All reports are arranged alphabetically and included in the Minutes of Wednesday, May 16.

The Tuesday Session of the BCcupms adjourned at 3:45 p.m.

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## **BCCUPMS and Secondary School Teachers Session**

### **1. Introductions and Opening Remarks**

We welcomed Duncan McDougall, Wendy Swonnell and Linda Rajotte to our Secondary School Teachers Session.

## 2. Reports

### 2.1 BCAMT – Robert Sidley

Robert reported that job action had forced cancellation of the Fall conference, which resulted in a significant drop in membership. As the association is funded by membership this limited work that could be done this year. A number of projects have been put on the back burner, including a vision document which is ready to come out. Currently there is no means to print or distribute it, however it should come out this Fall.

The BCAMT is looking forward to the North West Conference (held every three years) which will be held in Victoria, October 19 – 21 at the Empress. Teachers from Oregon, Washington State and BC are expected to attend, and members of the Bccupms are invited.

The BCAMT has continued to maintain contact with the Ministry regarding curriculum and assesment. Communication with members currently occurs via the listserve, a newsletter and Vector. Vector will soon be in CD format. The newsletter will be published on the website([www.bctf.bc.ca/bcamt/](http://www.bctf.bc.ca/bcamt/))—March is already available. By the end of May/June the newsletter will only be available to members.

### 2.2. BC Secondary Schools Mathematics Contest – Clint Lee (see attached report, page 24)

### 2.3 BC Universities Calculus Challenge Exam – Malgorzata Dubiel

Simon Fraser University is organizing the exam this year, however the exam has not yet been given. Details of last year's exam can be found on the UBC website.

This exam is meant as an exam for students who took BC Highschool Calculus, and is alternately offered by SFU and UBC. Students who pass the exam may choose to earn credit for a first-year university calculus course with their grade from the exam. The advantage over AB or IP exams is that students are able to earn a letter grade along with the credit. Students may choose not to take the credit. In fact, low numbers actually take advantage of the opportunity to write this exam. It was noted that colleges are also able to offer credit. Wayne Nagata indicated that UBC is willing to provide information to Registrar's Offices in order to facilitate this.

## 3. General Discussion

### a. Math 10 Final Exam: Will it be looked at?

Given that Math 10 grades will be reported for the first time on students' highschool transcripts there were questions about what impact this would have. Many colleges and universities do not, and will not be looking at grade 10 performance except for in their ABE areas. Camosun will be looking at it for their lowest level course.

Robert Sidley indicated that the introduction of the Math 10 exams will have an impact on students and teachers. It may produce anxiety about meeting outcomes. He clarified that students will now write provincial finals in Science, English, and Math in Grade 10 and Social Studies in Grade 11, while Grade 12 finals will be optional.

This led to discussion of whether institutions will accept Math 12 grades if the provincial exam has not been written. UBC, SFU, and UCFV will not accept Math 12 grades without a provincial final. UNBC would need to pass a motion through senate to make any changes to their current practice. They do not have anything in place to deal with this issue. Kwantlen's current system does not flag whether or not a provincial final has been written, and this will not change. It is important for institutions to investigate what their policy is.

Richard DeMerchant assured the group that the current wording recommends that students write Grade 12 provincial exams for admission to post-secondary institutions. The report card should still show both grades, and the exam will still carry 40% toward a blended Math 12 grade. He was uncertain whether recording of the grade in the provincial exam will be mandatory if the student opts to write it.

### b. Curriculum concerns

Linda Rajotte opened the discussion. She expressed appreciation for the current level of cooperation that was occurring around curriculum development and was interested in how people felt about the deletion of conic sections and statistics from the PM12 curriculum.

There seemed to be general agreement on the removal of statistics, although it was commented that it used to nicely round out the section on probability (which remains in the curriculum).

There was a sense that it was a shame that conic sections had been deleted. It was a good opportunity to apply algebraic manipulations (such as completing the square). It was noted that conic sections arise in higher level courses, and there was some concern about when conic sections will now be taught. However, overall, given the need for more time on other topics, the majority seemed happy enough to see conics withdrawn. SFU had already removed conics from their precalculus course.

Richard DeMerchant reported on the status of the new IRPs: they are still waiting for Ministry sign-off, but should be available within the next few weeks.

Ian Bailey asked about what had happened regarding the Preliminary Report on Curriculum Changes, and whether the BCcupms had responded to it. Gary McGillivray reported that although a subcommittee was formed last year to do this, for various reasons it did not happen. Some individuals had responded to the report, but there was no submission on behalf of the BCcupms.

Richard DeMerchant noted that there is ongoing opportunity for feedback, but adherence to deadlines is critical. In September/October focus groups will be formed to discuss outcomes and indicators for preliminary feedback. Then in March/April 2007 they will move to full consultation. Since requests for feedback are sent out to Academic Vice Presidents, Richard requested that reps let him know if there is a change in this position at their institution.

**Action (Gary McGillivray(organizer), Wayne Matthews, Jim Bailey): Establish a subcommittee to respond to the ongoing curriculum revision process on behalf of the BCcupms.**

Richard DeMerchant noted that the key issue right now is post-secondary acceptance of the Applications pathway. Highschools need endorsement of these courses by post-secondary institutions in order to make these courses successful. It was noted that the acceptance of Applications courses for university admission is a Registrar's Office decision, not a Math Department decision. In cases where requirements are programme specific, some progress has been made: SFU has added three math courses with Applications of Math as a prerequisite; Douglas offers a Math for Liberal Arts course with an Applications of Math prerequisite. One of the difficulties is that we have seen so few graduates with AM12 that there is difficulty in knowing what the preparation level of these students is.

**5. Adjourn to Reception.** The session adjourned at 5:35 p.m.

## **WEDNESDAY, MAY 17, 2006**

### **1. OPENING REMARKS**

#### **1.1 Introduction of representatives**

#### **1.2 Announcements from the host**

Gary MacGillivray announced that lunch will be served in the Arbutus/Queenswood room.

#### **1.3 Attendance lists**

Jim Bailey circulated the attendance lists.

#### **1.4 Call for Nominations**

Jim Bailey reminded members that there was still an opportunity to suggest names of individuals who would be interested in the Chair position to the nominations committee.

#### **1.5 Sign-up sheets**

Susan Milner invited members to set up final exam request sign up sheets on the table provided.

### **2. CORRESPONDENCE**

Susan Milner had been asked to write to both the Ministry and BCCAT last year regarding the BCcupms motion recommending transition courses between pathways in the highschool Math programme. She reported on the response from BCCAT, which indicated that the new on-line Education Planner should provide students with better information to help them choose an appropriate pathway sooner.

She had not received a reply from the Ministry, but Richard DeMerchant was prepared to reply in person. He indicated that transition courses have not been successful in the past and that transitions from Essentials to Applications are rare. He explained that students will be able to go from Applications to Principles and vice versa under the proposed changes using the Math 11 courses. Schools are doing things to facilitate transitions, so there doesn't seem to be a need for transition courses. The number of students is small, and those who fail PM11 tend to just retake it.

### **3. REPORTS**

#### **3.1 B.C. Council on Admissions and Transfers – David Leeming**

David reported on the recent activities of BCCAT:

- They are looking forward to the report on the flexible pre-major that was undertaken by a subcommittee of the BCcupms over the last year.
- They are looking into a number of issues surrounding the large number of new private institutions. Transfer issues and ESL/English language concerns are at the forefront.
- A recent survey consisting of 17 questions on the need for recalibration of the BC transfer system is complete. The conclusion was that the current system seems to be working well, but could use some tinkering to improve aspects of it. The full report will be available soon.
- The 2005 report on the mobility of transfer students in BC is available on BCCAT website.
- The new Education Planner is now accessible via the BCCAT website or directly at [www.educationplanner.ca](http://www.educationplanner.ca). This is a tool for students who want to decide on a career. 1500 career paths are included. Students can enter in their own requirements including location, length of programme, and costs. The site provides information on prerequisites, intake info, and career opportunities on graduation. David advised members of the committee to check the Math programmes at their own institutions to make sure information is accurate and to send any updates to Mike Winsemann, Transfer Guide Coordinator, who is the technical expert at BCCAT.

Leo Neufeld expressed concern about the Colleges/Institutes that don't attend articulation meetings and asked if there is a guideline from BCCAT in terms of who we should pursue? David replied that any private university that has a degree approved by DQAB has the right/privilege of attending articulation meetings, although the interest is somewhat determined by the mathematical content involved in the programmes.

### 3.2 ABE – Costa Karavas

This year's meeting was held at The Native Education Centre, Vancouver, B.C., May 2 – 3, 2006.

#### Articulation Guide

The guide contains transfer information (course numbers for equivalent courses at different institutions) and the learning outcomes for all our courses. There is also a list of members of the ABE math working group and their institutional contact information. See <http://www.aved.gov.bc.ca/abe/handbook.pdf>

#### Articulation of new and existing courses

New courses and revisions to existing ones were submitted from North Island College and VCC.

#### Presentations

- **by Kate Nonesuch, Career and Academic Preparation, Malaspina University-College, Cowichan Campus**

Presentation: What does research have to say about teaching numeracy to adults? The presentation focused on findings about instruction rather than about policy or curriculum, and included such topics as best practices, computer assisted learning, math anxiety, the practical-abstract continuum, and connections between literacy and numeracy instruction.

- **by Richard DeMerchant, Mathematics Coordinator, Ministry of Education, Victoria.** Mr. DeMerchant is responsible at the Ministry for revision of the Math K-12 curriculum.
  - (a) Refinement to the BC Mathematics 10-12 curriculum starting in September 2006 for grade 10, and September 2007 for grades 11 and 12.
  - (b) Western and Northern Canadian Protocol (WNCP) Common Curriculum Framework (CCF) revisions for grades 10-12 will start in 2010 for grade 10, 2011 for grade 11 and 2012 for grade 12. These will replace the refinements mentioned in "a" above.

#### Assessment Tools

ACCUPLACER is an assessment software used by colleges to assess in course placement. Selkirk has been using it for about 10 years. All students entering the college must do the test. It can take up to two and a half hours and covers reading, sentence skills and three levels of math. One problem is that it kicks students out of the test when they reach a math section they can't do, and they can't try further sections that they might be able to do. Thompson Rivers University uses it for all incoming students and charges \$40 for it. UCFV started using it about one year ago and had it "normed" for their institution. Kwantlen uses it for English placement but not for math.

#### Grading Systems

It was noted that there is a difference among colleges in the letter grading system, perhaps giving some students an unfair advantage over others when applying to various programs at college or university.

#### Articulation Meeting representation

Problems With Representation at Articulation Meetings – Some colleges are reluctant to send representatives to these meetings and make it difficult. One requires written justification for why they need to go. They also do not approve requests to attend the meetings for non-transferable courses. It was suggested that this should go to the Steering Committee.

Following Costa's report there was some discussion of computerized placement tests. At Selkirk the computerized placement test is non-binding and instructors have no access to student scores. UCFV and SFU had both considered Accuplacer. It was rejected by the Math & Stats Department at UCFV and by SFU due to concerns about US units and other issues. (ABE at UCFV is using Accuplacer.) Camosun is looking at the possibility of using Accuplacer. Douglas will be piloting Accuplacer, despite serious reservations, as well as Maple's Assessment Package in the Fall. SFU has chosen to go with a system called LON-CAPA for its new assessment test which they believe will do a better job of testing conceptual understanding as opposed to skills.

### 3.3 PIMS – David Leeming

David reported on the recent activities of PIMS

- The Banff International Research Station has been very successful. It continues to run a wide variety of high quality workshops that attract the best people from all over the world.
- The Education Advisory Committee of PIMS is very active and is now headed by Melania Alvarez-Adem. Malgorzata Dubiel and David Leeming are both members of this committee whose aim is to coordinate ideas and information to enhance outreach activities.
- The University of Regina is now signed on as member of PIMS.

In relation to outreach, Leo Neufeld asked about our links with Alberta, recalling the participation of Tiina Hohn from Grant MacEwan College, last year. David replied that there were two meetings of the North-South Committee last year; Jim Bailey attended the one in the Fall. David will try to go to the next one. No one from Alberta had been specifically invited this year.

### 3.4 Changing the Culture Conference – Malgorzata Dubiel

Malgorzata reported on the 8<sup>th</sup> Changing the Culture Conference whose theme this year was “Teaching Mathematics for Understanding”. Over 100 participants registered. Malgorzata requested help in coming up with a theme for next year’s conference.

### 3.5 AMATYC – Slava Simice

Slava reported on the AMATYC conference which she attended in San Diego last November. It offered 3½ days of workshops, with more offered at the ABE- than at the UT-level. The next meeting will be in Cincinnati. Slava was approached by 3 reps from Alaska who would like closer ties with BC.

**Action(Slava Simice and Susan Milner): Slava will email the names of the Alaska reps to Susan Milner who will invite them to come to next year’s BCcupms meeting as observers.**

## 4. BUSINESS ARISING FROM THE MINUTES OF THE 83<sup>rd</sup> MEETING

### 4.1 Flexible Pre-Major – Alex Liu

Alex distributed the report of the Flexible Pre-Major Committee (which was struck at last year’s articulation meeting) and discussed the details of the report. The report itself is meant to be a quick guide to what mathematics courses are required for majors at receiving institutions and to what extent those courses are offered by sending institutions. It also makes a number of recommendations.

Concerns that were raised included:

- The number of courses: given that a full-load for one year is 10 courses, the proposal could see students taking as many as three math courses per semester in order to complete the programme
- How to facilitate students taking courses (such as Analysis) at other institutions: Suggestions for dealing with this included development of on-line courses, or the possibility of setting up something like the Western Deans’ Agreement which allows grad students to take courses at other institutions. Open Learning already has a system for allowing students to get permission to take courses at other institutions, as does Simon Fraser University. The question of costs seems to be the real obstacle to this.
- The inclusion of Chemistry as one of the CORE requirements: There was some confusion about why Chemistry was chosen as opposed to other lab-science courses, and it was noted that students may wish to pursue a Math major in a Bachelor of Arts programme. On behalf of the committee Bruce Kadanoff explained that information on elective courses was limited at the time of writing the report. The intent of the committee was to recommend a quick guide to students as to what is generally required for a Mathematics degree, and Chemistry and Physics seemed the most appropriate Science electives. He reminded the group that flexibility is a key component of this proposal.

**Motion:** (moved by Alex Liu and seconded by Clint Lee)

**That the BCcupms accept the report and endorse the recommendations of the Mathematics Flexible Pre-Major Analysis Project.**

**Carried. (1 abstention)**

#### **4.2 Common Grading Scheme—Ian Bailey**

Ian Bailey opened the discussion by commenting that the Biology department at Malaspina is attempting to get all Science departments to use a common grading scheme in order to address inequities that seem to be occurring when students transfer to other institutions. It is typical that when students transfer a letter grade from one institution to another, they are assigned the bottom percentage of the range for that grade at the receiving institution.

Wayne Matthews reported that he had done some research on how other institutions had dealt with this in order to inform policy changes at Camosun. Since 90% of Camosun students transfer to UVIC, it seemed appropriate to align their policy with UVIC. A new policy was recently approved that dropped an A+ down to 90%.

General discussion about the inconsistencies at all levels in the assignment of both percentages and letter grades, and the pros and cons of using bell curves for grading. Concerns about grade inflation were also raised. Although it would be ideal if we could all use the same measuring stick, attainment of this seems impossible. Malgorzata Dubiel and Bruce Kadanoff both expressed the view that an A+ should be reserved for exceptional students. Richard DeMerchant referred members to a very good paper on educational assessment which can be found at [www.wncp.ca](http://www.wncp.ca).

It was interesting to note that at Kwantlen University College instructors have the options of entering either a percentage or a letter grade for their students at the end of the term, while other institutions can only enter one or the other.

**Report of Nominating Committee for the Chair of the BCcupms:** On behalf of the nominating committee, Jim Bailey reported that Susan Milner was willing to continue in the Chair position for another term. After three calls for nominations, there were no other candidates.

**Susan Milner was acclaimed as Chair for another two year term.**

### **5. NEW BUSINESS**

#### **5.1 Core Calculus review slated for next year—Leo Neufeld**

Leo reminded the group that the Report of the Core Calculus Committee was approved in 2002 at the meeting at Douglas College. At that time, all recommendations were accepted including the recommendation for a mandatory full review of the report after 5 years. The review should be completed by June 2007, but could be initiated now. The Report is still available on the BCcupms web-site along with the follow-up that took place the year after.

Susan Milner suggested that because April 2007 is the deadline for comments on the proposed K-12 curriculum revisions, it might be useful to do the review sooner rather than later. There was a general sense that the current core curriculum is quite good, but that having Richard DeMerchant involved in the review would be an asset. A subcommittee for the review should be struck.

**Action(Bruce Kadanoff, Richard DeMerchant, Malgorzata Dubiel (or SFU designate), Susan Milner, Wayne Nagata, David Leeming): Review the Core Calculus Report, send out information to the BCcupms via email, and get approval from the committee as a whole in time for the information gathered to be helpful to the Ministry. David Leeming will call the first meeting.**

#### **5.2 Transfer to SFU under new system—Larry Weldon**

Larry described the recent changes to SFU's degree requirements which will take effect this Fall. Students will now be required to take a certain number of Writing Intensive, Quantitative Reasoning, and Breadth courses. He distributed a brief summary of articulation concerns related to these new requirements, and noted particularly that they have worked

with BCCAT to add W, Q, and B designations to courses in the Transfer Guide. The document also outlines the process for articulation of college courses. He encouraged members to visit the website at [www.sfu.ca/ugcr](http://www.sfu.ca/ugcr).

### 5.3 Institutional policies regarding transfer of credits (e.g. 4 for 4? 3 for 4? 4 for 3?)

Susan Milner asked receiving institutions what they do when students enter with equivalent courses that carry different credit value from what they normally award for that same course.

Malgorzata Dubiel reported that if the sending institution awards more credits, SFU still just gives the maximum number of credits normally awarded at SFU, unless the course taken by the student has significantly more content. In this case the student may get one extra unassigned credit. If the sending institution awards fewer credits than SFU, it varies: if content is exactly the same, it may get the same number of credits, although the sending institution may need to justify why its course is comparable to theirs. Sometimes too little information is provided. Institutions should make a case for what they think would be fair.

In support of this, Bruce Kadanoff observed that Physics gets 3 credits at Coquitlam College and 5 credits at SFU.

Gary MacGillivray noted that UVIC has a quite different crediting system. All courses carry the same weight regardless of the number of hours. The number of credits is strictly a matter of content. A particular course could get credit for one course plus unassigned credit. Partial credit for a course is never awarded, and incoming students can not get more credits than they earned at their original institution.

Wayne Nagata commented that the system at UBC is similar to Simon Fraser.

### 5.4 Math contest—Clint Lee

Since the inception of the BC Secondary School Math Contest John Grant McLoughlin has been involved. This involvement continued over the years, even when he moved back east to Memorial University, and then on to the University of New Brunswick. He has played a very active role in setting the exams over the years, and it seems appropriate to acknowledge his valuable contribution.

**Motion:** (moved by Clint Lee and seconded by Bevan Ferreira)

**That the BCcupms acknowledges and expresses its gratitude for the ongoing contributions of Professor John Grant McLoughlin of the University of New Brunswick to the BCSSMC through his contributed problems and review of contest papers and solutions through all stages of preparation.**

**Carried unanimously.**

### 5.5 Numbers of Math Majors (past few years)

Degree granting institutions reported on the number of Math Majors in their programmes over the past few years:

UVIC: Numbers seem to be going up gradually.

TRU: Numbers are small but are going up (5,6,7, 9).

SFU: There has been a slow upwards trend (73 to 77) but there is a feeling that the numbers will begin to go down. Computing Science had a high GPA for their majors, but now that the number of seats in Computing Science has increased they have reduced their major requirement. Some students were Math majors because they could not get into Computing Science, but now they will be able to enter their first choice programme.

UBC: Numbers seem steady with 90 per year for the last three years, but within that the Honours option has grown 10-20% .

UNBC: Numbers have been steady for the last 3 years, although there was a sharp increase 4 or 5 years ago.

UBC Statistics: There has been modest increase (15, 23, 36, 41) in Statistics majors.

SFU Statistics: There has been a slight overall increase due to the Actuarial Science Programme. There are the same number of majors in Statistics as in Actuarial Science.

It was noted that these numbers did not include students who are in Joint Major programmes that included Math.

**Report of Nominating Committee for the Chair of the Statistics Subcommittee of the BCcupms:** Kevin Keen reported on behalf of the nominating committee for the Chair of the Statistics Subcommittee.

**Motion:** (moved by Kevin Keen and seconded by Susan Chen)

**That Bruce Dunham be acclaimed as Chair of the Statistics Subcommittee of the BCcupms.**

**Carried unanimously.**

## 6. INSTITUTIONAL REPORTS

### BCIT – Colin Lawrence

- The two-year Degree transfer Program in Science and Technology successfully got off the ground in September 2005. This program will form the first and, in some cases, the first two years of several BCIT degree programs (B. Tech, B.Eng etc). As an additional incentive to enrolment many of the courses in the program have been articulated with their equivalents at the universities and colleges. An articulation request has been issued for a second year course, MATH 3100, Probability and Statistics in Applied Science.
- Approval was gained for a B.Eng program in Civil Engineering. BCIT is seeking accreditation for this degree from the Canadian Engineering Accreditation Board as an appropriate qualification leading to registration as a P.Eng. Other departments are seeking approval to offer B.Eng. programs.

### CAMOSUN – Wayne Matthews

The math dept at Camosun now is responsible for teaching all the grade 11 level courses and up. Our lowest level course is grade 10/11 algebra followed by a unit on trig. This is the “advanced level” category in ABE. Below that the courses are taught by the foundations dept in the new School of Access and First Nations, formerly known as ABEFN. Both the advanced and provincial level (grade 12) are offered as self-paced and lecture based format. Our strong recommendation to students is that they take a lecture based course before attempting any UT course in mathematics. All of the courses in the School of Access are tuition free for non-international students.

The other two pre-calculus courses (math12 level) are UT and are housed in the School of Arts & Science. Some instructors, and the chair, are financially and procedurally bound to two separate schools.....two deans, office structures and procedures etc.....

The theory is that the students will have a seamless transition from upgrading to UT and that only the instructors and staff will suffer the two-school issues. It seems to be working for the students, and the staff are coping with the umbrella nature of their life – one department, spanning two schools.

### CAPILANO – Wendy Lynn

#### 1. Courses/Program

- Both the Engineering and Engineering Transition programs continue to have strong enrollment and have positive spin-off benefits for mathematics. A math faculty member, Lisa Lajeunesse, is continuing as the engineering programs convener.
- For the second year in a row we have experienced a decline in math and stat enrollment, down about 23% in the Fall 05 Term compared to the Fall 04 Term and down about 24% in the Spring 06 Term compared to the Spring 05 Term. We continue to be concerned about the potential for continued enrollment decline in the 06/07 academic year.
- With UBC no longer requiring Calc II for the Commerce Program effective Fall 07, we are expecting to offer three fewer sections of our Calc II course for business/social science students in the 06/07 academic year.

#### 2. Faculty

- Ted Bentley has returned to Capilano College to teach part-time.
- Steve Overduin, the newest addition to our dept, has resigned to pursue other interests.
- Ian Affleck has resigned to accept a position at UCFV.
- Because of the significant drop in enrollments at Cap and some restructuring in our math program, the positions created by the retirement and resignations of math faculty no longer exist.

### **COLLEGE OF THE ROCKIES** – Jim Bailey

Student numbers are down, particularly in second year. We have not lost any courses, at least in part because we have a new management structure:

- two of our deans left for Okanagan College. They have been replaced by three deans, Ardy Smith Miller (a curriculum specialist, formerly with Yukon College), Gary Johnson (a physicist originally in Abu Dhabi, United Arab Emirates), and Ron McRae (local candidate.)
- we have a new department head structure. The department head for university transfer used to teach ESL, the department head who used to be a university transfer instructor is in charge of nursing and so on. It is hoped that they will bring a fresh approach to the departments which they are responsible for. They are still learning their jobs.
- Richard Hewko has been given a one year educational leave. He will be at Arizona State University studying Math Anxiety with Robb McDuff. He has been replaced by Luda Tchvialava, a Russian trained physicist with a strong math background. She has taught some physics courses at UCFV and has expressed an interest in trying our combined Math-Physics team teaching.

### **COQUITLAM** – Bruce Kadanoff

Enrolment down somewhat in the UT area but stabilizing over the past couple of semesters. No substantial changes to staff or courses. WRT articulation, we are looking to re-align a business statistics course with the updated UBC Commerce Program that kicks off in the fall (business stats is part of the Math and Stats Dept at Coquitlam College.)

### **DOUGLAS** – Wesley Snider

Enrolments are at the same level as last year.

Math 1234 (Math for Liberal Arts) was offered for the first time this past semester with an enrolment of 14. We are hopeful that this number will increase substantially as our Sports Science department has included Math 1234 as a first semester math requirement for its new Bachelor of Physical Education and Coaching (Secondary Stream) degree.

Our Psychiatric Nursing department has requested that we teach a section of our Math 1160 (Introduction to Statistics) - funded by them - each semester on-site at Riverview Hospital. There has also been a request from a local secondary school that we investigate the possibility of offering Calculus I on-site, though initially the logistics seem difficult. These initiatives could lead to some modest growth in the near future.

We are in the early stages of developing a History of Mathematics course. Although it may be an appealing “Q-course” for some students, it is not clear that there is sufficient demand at this time.

Our struggles with administration over the piloting of Accuplacer as a one-stop shopping assessment tool continue. Susan Oesterle has finally managed to convince administration that we should also be piloting the MAPLE assessment software which seems more appropriate for our needs.

This year we took part in the High School Math Contest for the first time. Justin Gray of SFU was our guest speaker/entertainer. We had a total of 39 students from five schools sit the junior and senior exams and we expect to have more schools participate next year.

The Faculty of Science and Technology is currently in the process of searching for a new Dean as Des Wilson is retiring.

### **FRASER VALLEY** – Susan Milner

We have made no major changes to our first- and second-year offerings this year, although we have added new upper-level courses in metric spaces, geometry, algebra, and an honours project. Plans for honours degrees in mathematics and statistics are at the final stage of approval.

Our overall enrolments have been stable over the past two years after showing steady growth for a decade or so. We are offering more sections of Precalculus every year. Calculus I, II and III are all stable, as are both of our Introductory Statistics courses, but there is much less demand for Discrete Mathematics. UCFV’s Computing Information Systems programme has

suffered a substantial loss of students, so in an effort to attract more students that department has lowered its entrance requirements and created a pre-university level math course to replace the discrete math course.

Our upper-level courses continue to grow: the Operations Research stream is popular, Complex Analysis hit a record high of 37 students. UCFV has a full summer term now: the Numerical Analysis Course is very popular this summer and Design of Experiments has a healthy enrolment.

A new position was created for the 2005/6 academic year and a new half-position for the upcoming year.

#### **KWANTLEN – Michael Nyenhuis**

This year saw disastrous enrolments. Our most popular course, Math 1112 has gone from 500 two years ago to 300 this year, and many sections in our other courses were far from full (i.e. maybe 10 students rather than 35). We do not know why there was such a large decline.

In terms of courses, this year we offered precalculus in two versions. Students who had a C+ in Principles of Math 12 could register for the usual Math 1112, those with a C had to register for Math 1113 (equivalent to Math 1112) and an extra two-hour course, Math 1111. Enrolments in Math 1111/1113 were not as good as expected. We were expecting about 18 students in each section of Math 1111/1113, but many sections had between 4 and 10 students. It seems that the general decline in enrolments and the fact that 40% rather than 50% of our precalculus students this year got a “C” in Principles of Math 12 students produced this result. We will not be offering Math 1111/1113 in the future. Despite the bad news, students and instructors seemed to be happy with the Math 1111/1113.

This year we ran two new courses: Math 1152, Matrix Algebra for Engineers; and Math 1116, Mathematical Explorations, which is intended to satisfy the Q requirement for SFU-bound students who do not want to take a more traditional math course. It also satisfies the W requirement at SFU. Math 2232 (Linear Algebra) has a new outline as well. The Math 2232 outline covers almost all the material we used to cover, but what is actually taught has been made clearer.

In 2007 we will be starting the B.A. with a Math minor, and we hope to begin offering 3<sup>rd</sup> and 4<sup>th</sup> year courses in the B.A. Math minor starting then. We understand it has been approved by DQAB (Degree Quality Assurance Board), and only await the letter. The minor is intended for students who want to teach high school math, but do not want a full-fledged B.Sc. in Math.

With respect to the number of Bachelors we produce in Math and Stats, we do not have a Bachelor's program yet.

#### **LANGARA – Nora Franzova**

##### **Enrollments:**

Enrollment in Math and stats courses at Langara continues to decline by about 5-6% per year. However, we seem to have turned a corner and we are expecting no further decline, even small increases for the Fall of 2006 (based on new application numbers).

##### **Student Preparation:**

A number of instructors have reported to me that their students do not seem to be as strong as in past years. This is not surprising given that the universities have lowered their entrance requirements in some cases. One way we have responded is by trying promote alternatives to our usual beginning calculus course, math 1171. We have a computer aided course (1173) and we have a first semester calculus course spread over 2 semesters (1153/1253). Perhaps as many as half of our 1171 students would be better served if they took one of these alternatives. So far our promotional efforts haven't resulted in a noticeable shift in the enrollment pattern, but we hope to have a significant shift by Fall of 2007.

##### **New Courses:**

We have gotten permission to offer two new second year courses (subject to adequate enrollment). These are Numerical Analysis (2485) and Mathematical Modeling (2365). Our plan is to offer 2365 in the Fall and 2485 in the Spring, but we may reverse this, because Numerical Analysis can substitute for Real Analysis at some universities. Then we could offer real analysis and numerical analysis in alternating years. These courses would give us enough to offer an ASc degree in Math.

**Transfer Agreements:**

We have not pursued transfer agreements with UBCO because, so far, none of our students are transferring their. But this is something we still need to work on.

**Changes to Math Requirements for UBC Commerce:**

The changes do not seem to be affecting us too much yet, at least we cannot identify reduced enrollments in calculus II for business and economics as being caused by the changes. This may change starting in Spring 2007 (I believe this is the first, second half of the year, under the new requirements, when calculus II is no longer required.). Also, our statistics course and linear programming course for business students have reduced enrollments, but not more so than the general trend.

**Mastery Units for Pre-Calculus Sequence:**

We are still struggling with how to introduce mastery units into our pre-calculus sequence using computer software of some sort. Our latest attempts are to make WebCT work for us, since we already have a site license.

**LANGARA (STATISTICS) – Veda Abu-Bakare**

Langara has developed a new STAT course, STAT 3223 Intermediate Quantitative Methods, which is designed to meet the needs of students enrolled in a business administration degree program and those planning to achieve a professional accounting designation such as a Certified General Accountant (CGA). Topics include statistical inference for one and two populations, simple linear regression multiple linear regression, index numbers and time series analysis, decision theory, and linear programming.

**MALASPINA – Ian Bailey**

Enrollment was strong, it seems to increase a little each year, especially from international students.

We have one retiree, Ray Sproule, and three new permanent faculty: Valerie Watts (from Carleton), Dean Slonowsky (Manitoba), and Glen Pugh (UBC).

Next year we will offer a 3rd year course, Cyphers and Cryptography, for the first time. We have lost most of our enrollment in our calculus for commerce courses. Instead of transferring, many students are choosing to remain at Malaspina in a new B.B.A program that has no calculus requirement. Institutionally, Malaspina will have a new President and a new Vice-President Academic within a year, and likely a new science building within three years.

**NEW CALEDONIA – Claude Hurtabise**

**NORTH ISLAND – Slava Simice**

- Enrollments were up in University Transfers Courses but down in ABE and in Math for Elementary Education. We had considerable increase in 2<sup>nd</sup> year courses.
- For the fourth time we have hosted a BC Colleges High School Mathematics Contest. Only two schools participated in the final round.
- We are in a process of hiring a new dean of university transfers since Brigid Walters is retiring. Don Gillingham will replace Brigid Walters on BCCATT Committee.
- Emily Carr will be starting 4<sup>th</sup> year this year.
- Computer Sciences and Fine Arts have developed a new program-Communication and Design Technology Diploma-to be in place by the fall.
- In partnership with UVIC, we have a new interesting program regarding Aboriginal Education.
- Albert Balbon is getting Innovation Award for his support and services for BC-Campus courses.

**NORTHERN LIGHTS - Mahmoud Ziaei**

1. Some decline in enrollments.
2. Some minor revisions to our different math courses. Details available on request from [hcu@nlc.bc.ca](mailto:hcu@nlc.bc.ca)

**NORTHWEST – Mona Izumi**

We continue to offer Calculus I, Calculus II, and Introductory Statistics at both Terrace and Prince Rupert. Math for Elementary Teachers is offered face to face in Terrace and online through BC Campus. We also participated in the Moodle project through BC Campus and Malaspina and offered Precalculus in the winter semester.

Last year a Differential Equations course was articulated and its first offering was to be in Terrace in September. Due to lack of student enrolments, the course did not run. We are not optimistic that it will be offered anytime in the immediate future.

Northwest Community College in partnership with other rural colleges and BC Campus is developing an online Associate of Arts in First Nations Studies. Because our student population is over 40% First Nations, I would very much like to develop an ethnomathematics course which could be used as a math credit in that program. I would appreciate any input from institutions who have such a course.

## **OKANAGAN – Clint Lee**

### **Enrollments**

In Kelowna the enrollments were a bit low, but acceptable considering the confusion in the community around the emergence UBC Okanagan. The Business program, both diploma and degree, is doing well, which helps to bolster the enrollments in Mathematics and Statistics courses. On the other campuses enrollments were quite low, but the University Science program, and in particular, the associated Mathematics courses, will be maintained, at least at first year, on all campuses.

### **Second Year Mathematics Offerings**

The only second year Mathematics and Statistics courses offered in the 2005/06 academic year were: Linear Algebra at all campuses (cancelled in Penticton and done by video conferencing in Salmon Arm), Discrete Mathematics in Kelowna for the Computer Science programs, Calculus III in Vernon, and post-calculus Statistics in Vernon, mainly for Biology students. The following second year Mathematics courses will be offered in Kelowna in the 2006/07 academic year: Calculus III (also offered in Vernon), Differential Equations, and Proofs.

### **Course Changes**

There will be no new courses coming on stream next year. The only change will be that the number of hours in Calculus I and II will be increased to four hours lecture and one hour lab, from three hours lecture and one hour lab. In addition, Okanagan College has officially adopted the Calculus Challenge Exam policy, which will appear in the College Calendar this year.

### **Hiring at Okanagan College**

There currently are 2.5 positions of Mathematics and Statistics positions, almost entirely in Kelowna, for which we have no faculty. Advertisements for these positions should be appearing in the near future. In addition, Clint Lee will be on sabbatical next year, so there will be an additional replacement position in Vernon.

### **New Contract**

The Okanagan College Faculty Association and Okanagan College negotiated a new contract that was ratified on March 30, 2006. The main features of the new contract are a return to the provincial grid, with red circling of any faculty who were above the grid, and a quasi four by four workload scheme. The workload scheme means an increase in teaching workload for some, but a decrease for others, notably most faculty in Mathematics and Statistics.

## **SELKIRK – Bevan Ferreira**

There is not much that is new this year in the Mathematics and Statistics stream at Selkirk College. Our recently-introduced second-year, calculus-based introductory statistics course, STAT 206, continues to hold steady enrolment, and has thus far had some appeal beyond its intended audience of science and engineering majors.

In the fall semester of this year we will introduce a 1½ -hour lecture format to replace our previous 2-1 (with 2-hour lab) and 2-2 structure. It was felt that this would help us cover certain courses more effectively, would bring us more into line with current university practise, and also help ease timetabling restrictions.

The University Arts and Sciences programme at Selkirk continues to struggle with low enrolment, particularly in the second year courses. We are still hopeful that will change in the late summer.

### SFU – Malgorzata Dubiel

1. Several new courses were approved, including MATH 150 (Calculus I with Review), MATH 121 (Mathematical Expeditions), MATH 160 (Math in Action), MATH 178 (Fractals and Chaos), MATH 197 (Hitchhiker's Guide to Everyday Math), MATH 370 (The Art and Craft of Problem Solving), and FAN 099, Foundations of Analytical and Quantitative Reasoning, a course which is part of the new SFU admissions requirement.
2. The Department has created a committee to review teaching of our introductory calculus courses, with the aim to improve students' experience and success rates.
3. The Calculus Challenge Exam was organized by SFU this year, coordinated by Natalia Kouzniak.
4. Quantitative Placement Test, a part of the new SFU admissions requirement, has been developed. The Calculus Readiness test is being developed, to replace our old Math Assessment Test, starting July 2006. For information about the tests and a link to practice tests, see our website, [www.math.sfu.ca](http://www.math.sfu.ca).
5. The Department had an External Review in April. The report was very positive; however, it included a comment on underrepresentation of women amongst the faculty members.
6. The last two founding members of the department are retiring: Norman Reilly has retired in August 2006, and Len Berggren is retiring in August 2006.
7. The department has celebrated 80<sup>th</sup> birthday of Ron Harrop, the founding chair, on May 12<sup>th</sup>, 2006.

### THOMPSON RIVERS – Fae DeBeck

#### Enrolments:

Overall enrolments are up due to an increase in the number of international students registering for courses in the School of Business. The Mathematics/Statistics department offers 2 service courses for the BA (Econ) and the BBA.

#### Course Changes:

The business calculus 2 course sequence, MATH 140/141, has been replaced by a new sequence, MATH 107/117. MATH 107 includes math of finance, difference equations and linear algebra and MATH 117 is basic differential calculus with business applications.

There have been a number of changes proposed to our offerings in discrete math. Currently, a single discrete math course, MATH 222, is required for majors in mathematical sciences or computing science, and is an elective for majors in mathematics. The proposal is to replace MATH 222 with a 2 course sequence MATH 170/270 and have both as degree requirement for mathematical science and computing science majors and have MATH 170 required for majors in mathematics.

#### New Courses/Options:

We now offer an honours degree in mathematics.

We now offer a co-op option in mathematics and statistics.

#### New Collective Agreement:

The TRU Faculty Association has negotiated its first collective agreement as a university. Negotiations were completed in time for the signing bonus. The new agreement has a new salary grid connected to academic designation and departments have much more control over workload issues.

#### Faculty Changes:

Two new people joined us in 2005/2006 – Dr. Richard Taylor from OUC and Dr. Robb Fry from St. Francis Xavier. Their appointments filled vacancies left by John Siggers and Kirk Evenrude who both retired in August of 2005.

Three more retirements are coming up in 2006/2007. Dr. Jack Bradshaw is leaving at the end of December, 2006 and Don DesBrisay, who is the other half of a shared appointment with Jack, will be going at the end of April, 2007. Dr. Jim Totten is also leaving at the end of the 2006/2007 academic year.

#### Achievements

We celebrated the conferring of an honorary doctorate to John Ciriani (retired), a long-serving member of our department. Dr. Roger Yu received the 2005/2006 TRU award for research excellence.

### **THOMPSON RIVERS (OPEN LEARNING) – Veda Abu-Bakare**

As of April 1, 2005, the University College of the Cariboo and the BC Open University became Thompson Rivers University (TRU). The BC Open University part became the Open Learning Division of TRU. It is still located in Burnaby and delivers its own courses and programs, but it will move to Kamloops by March 31, 2007. A building is being constructed now – the BC Centre for Open Learning (BCCOL). Whether we will be a stand-alone unit or whether we will be integrated by departments is still being worked out. However the mandate of providing open and distance learning is a high priority and the position of Vice-President, Open Learning has been created. Candidates are currently being interviewed.

Our enrollments have dropped by about 20% because of the transition and the disappearance of the Open Learning brand. Marketing efforts are underway to keep the Open Learning focus. Our Calculus courses have been revised for the 5<sup>th</sup> edition of Stewart, Early Transcendentals. The STAT 102 is being revised for DeVeaux and Velleman intro stat text.

### **UBC (Vancouver) – Wayne Nagata**

1. UBC has recently begun offering a Combined Major in Mathematics and Economics, either B.A. or B.Sc.
2. Transfer credit from UBC-O is still treated as if UBC-O was an independent university.
3. Articulation agreements involving UBC Math 111 continue to be renegotiated.
4. UBC will continue to require BC provincial exam results for admission, even after these exams become optional.
5. Recent final exams for most UBC math courses are available at <http://www.math.ubc.ca/Ugrad/pastExams/>

### **UNBC – Kevin Keen**

1. Concerning enrolment figures, the following is reported.
  - a) Enrolment university-wide was down approximately 2% compared to the previous year.
  - b) The Mathematics Program had a 7.7% increase in annualized EET's in 2005/2006 over 2004/2005. But there was a modest drop in FTE's.
2. Concerning new programs or changes in programs introduced, the following is noted.
  - a) A new joint undergraduate program in Economics & Mathematics has been created and approved by Senate and the Board of Governors;
  - b) A new undergraduate degree called the Bachelor of Health Sciences has been created. This program will start to enroll 40 students in September 2006. All students are required to enroll in an introductory statistics course. Those students registering in the biomedical stream of this new degree program, with many intending to continue to medical school, possibly at UNBC, are also required to enroll in MATH 100 Calculus I and MATH 101 Calculus II.
3. With regard to staffing, the following is reported.
  - a) A second statistician has been hired by the Mathematics Program at the Associate Professor level. (There are six statisticians in other programs at UNBC in addition to those in the Mathematics Program.)
  - b) The Program is advertising for one term position as a sabbatical replacement.
4. Concerning construction projects on UNBC campuses, the following is reported.
  - a) Construction is well progressed on a new Teaching and Learning Building to provide faculty offices and classrooms. Programs with offices on the top floor of the Library, such as Mathematics, and those in the Administration Building will be moving to the new building
  - b) Construction has begun on the Northern Sports Centre to house: an indoor track; soccer fields; tennis, basketball, and squash courts. This is the result of a public private partnership involving UNBC, local governments, and business interests.
  - c) A new building has been secured in Terrace to become the new Terrace campus of UNBC. There will be additional space with the new building to make it possible to offer lab-based courses in Terrace.
5. Concerning senior administration at UNBC, the following is noted.
  - a) Dr. Donald Cozzetto will succeed Dr. Charles Jago as President of UNBC in 2006 upon Dr. Jago reaching mandatory retirement age.
  - b) Dr. Paul Madak was appointed to the newly created position of Dean of Enrolment and Recruitment at UNBC.
6. The single letter grade of D has been succeeded by D-, D, and D+ at UNBC.

7. Graduating undergraduate students in 2005 at UNBC included 5 Mathematics Majors, 1 Computer Science and Mathematics Joint Major, 1 Double Major in Computer Science and Mathematics. Previously in 2004, among the graduating class were 6 Mathematics Majors, 1 Double Major in Mathematics and Physics, 1 Double Major in Mathematics and Economics, 1 Chemistry and Mathematics Joint Major, and 1 Computer Science and Mathematics Joint Major. In 2003, graduates included 5 Mathematics Majors, 1 Chemistry and Mathematics Joint Major, 2 Computer Science and Mathematics Joint Majors, and 1 Double Major in Mathematics and Physics.

#### UVIC – Gary MacGillivray

There has been quite a lot of change in the Math and Stats Department at UVic. Six new faculty members started last year. We are currently in the process of replacing four further retirements. This represents 1/3 of the Department! It is promised that the growing hole in the ground on the site of the former parking lot D will develop into the new Social Sciences and Mathematics Building by February 2008.

Enrollment was about 8% in 05-06. This was mostly due to Economics, and Business (most Business students also take Economics courses and thus their Math pre-requisites). The service courses we teach for Computer Science are still suffering as is the case everywhere in North America.

Curriculum changes have included our precalculus course moving from 4 hours of instruction to 3 hours plus a tutorial (it too soon to tell how well this works), three new 300-level Statistics classes, and the elimination of Math 103 (Math for Economics). The latter was at the request of the Economics Department. They wanted a new course, Math 140, including more linear algebra and less linear programming, to be developed. Courses currently transferable as Math 103 will need to be re-articulated for possible transfer to Math 140.

Curriculum proposals under consideration for this year include a new joint program with Education leading to a B.Sc. in Math and a teaching certificate, a new Financial Mathematics and Econometrics program (joint with Economics), and changing our science Calculus from 4 hours of instruction to 3 hours of instruction.

#### VCC – Costa Karavas

- Precalculus, Calculus I, Calculus II and Introduction to Statistics are offered every semester including the summer.
- Calculus I is strong in the fall semester, but Calculus II is weak during the summer.
- Introduction to Statistics course is popular as it serves as a prerequisite course for the Dental Hygiene program.
- Building expansion at the King Edward campus is proceeding with phase I starting later in 2006.

New Vice President of Education Dr. Alan Davis joined VCC in Jan. 2006

**Milestones:** The committee took a moment to remember John Peregrym who passed away in a motor vehicle accident just under a year ago. Deep appreciation was expressed for his contribution to this committee over the years dating back to the first meeting held outside Vancouver, which was hosted by Selkirk College.

## 7. COMMITTEE BUSINESS

### 7.1 Theme for our 85<sup>th</sup> Meeting

Suggestions for themes for next year's meeting included: Courses for Business and Economics, Liberal Arts Courses, Math Anxiety, Placement Testing, First Year Linear Algebra Core Curriculum, and Alternative Delivery Methods.

### 7.2 Date and Location of the 85<sup>th</sup> meeting

The next meeting will be held in Whitehorse, Yukon on May 15 – 17. Langara College has offered to host the 2008 meeting and Thompson Rivers University would like to host the meeting in 2009.

### 7.3 List Updates: Mailing, Telephone, Fax and E-mail.

Camosun College is providing the host site for the Statistics Listserve. Please email Geoff Salloum at [salloumg@camosun.bc.ca](mailto:salloumg@camosun.bc.ca) to join. Leo Neufeld asked members to check the BCcupms website to ensure that the information is correct for the representative of your institution. Let Leo know of any corrections that need to be made. He

reminded the committee that the posting of positions is also available on the website. When an email announcing a job opportunity is sent to the BCcupms listserv, Leo transfers information on the job posting to the website.

#### **7.4 BCcupms Web Site – Leo Neufeld**

There have been some difficulties with plans to move the BCcupms website to BCCAT. Ian Affleck will be taking over management of the website sometime in the summer and will be moving it to UCFV. It is not ideal that the web site will have to move, but it can always be found using Google. Malgorzata Dubiel mentioned that the CMS owns the domain name “math.ca” and it may be helpful and appropriate for the BCcupms to make a request for the use of this.

Susan Milner reminded the group of the Math Contest Problem Writing Session planned for Thursday after the PD sessions.

#### **8. Adjournment of the Wednesday session**

The Wednesday Session of the 84<sup>th</sup> meeting of the BCcupms adjourned at 4:12 p.m.

**Many, many thanks to Gary MacGillivray and UVIC for all their work in hosting us for this meeting.**

**List of Committee Members Present Plenary Session – Tuesday, May 16, 2006 (a.m./p.m.);  
 Concurrent Math/Stats – Tuesday, May 16, 2006, Plenary Session – Wednesday, May 17, 2006(a.m./p.m.)**

Name	Institution	TUES	MATH	STATS	TEACHER	WED
Veda Abu-Bakare	Langara College/Thompson Rivers University—Open Learning	X		X	X	X
Richard Atkins	Trinity Western University	X	X		X	
Ian Bailey	Malaspina University College	X	X		X	X
Jim Bailey	College of the Rockies (Vice Chair)	X	X		X	X
George Ballinger	Camosun College	X	X			
Susan Chen	Camosun College	X		X	X	X
Fae DeBeck	Thompson Rivers University	X	X		X	X
Richard DeMerchant	Ministry of Education	X	X		X	X
Malgorzata Dubiel	Simon Fraser University	X	X		X	X
Bruce Dunham	University of British Columbia—Statistics	X		X	X	a.m.
Bevan Ferreira	Selkirk College	X		X	X	X
Nora Franzova	Langara College	X	X		X	X
Jane Gardiner	Ministry of Education	a.m.				
Pierre Gilbert	Ministry of Education	a.m.				
Claude Hurtubise	College of New Caledonia	X		X	X	X
Mona Izumi	Northwest Community College	X	X		X	X
Bruce Kadonoff	Coquitlam College	X	X		X	X
Costa Karavas	Vancouver Community College	X	X		X	X
Kevin Keen	University of Northern BC	X		X	X	X
Colin Lawrence	BC Institute of Technology	X		X		X
Clint Lee	Okanagan College	X	X			X
David Leeming	University of Victoria (Emeritus)	X	X			X
Alex Liu	Kwantlen University College	X		X	X	X
Paul Lukaszek	Ministry of Education	a.m.				
Wendy Lynn	Capilano College	X	X			X
Gary MacGillivray	University of Victoria	X			X	X
Wayne Matthews	Camosun College	X	X		X	X
Duncan McDougall	TutorFind Learning Center				X	
Susan Milner	University College of the Fraser Valley (Chair)	X	X		X	X
Wayne Nagata	University of British Columbia (Vancouver)	X	X		X	X
Leo Neufeld	Camosun College (Retired)	X	X		X	X
Michael Nyenhuis	Kwantlen University-College	X	X		X	X
Susan Oesterle	Douglas College (Secretary)	X	X		X	X
Monica Pamer	Ministry of Education	a.m.				
Leslie Francis Pelton	University of Victoria				X	
Linda Rajotte	St. Michael's University School				X	
Geoffrey Salloum	Camosun College	X		X		X
Robert Sidley	BC Association of Mathematics Teachers	X	X		X	
Slava Simice	North Island College	X	X		X	X
Jill Simmons	University of Victoria	p.m.	X		X	
Wesley Snider	Douglas College	X	X		X	X
Wendy Swonnell	Retired Teacher				X	
Peggy Tilley	Camosun College	a.m.	X			
Tim Topper	Yukon College	X	X		X	X
Ken Towson	Capilano College	X		X	X	X
Min Tsao	University of Victoria			X		
Larry Weldon	Simon Fraser University—Statistics	X		X	X	X
Patricia Wrean	Camosun College	X	X			X
Julie Zhou	University of Victoria	a.m.		X		a.m.
Mahmoud Ziaei	Northern Lights College	X	X		X	X

**List of Participants (Professional Development Sessions (Statistics)) – Thursday, May 18, 2006)**

<b>Name</b>	<b>Institution</b>
Veda Abu-Bakare	Langara College/Thompson Rivers University—Open Learning
Susan Chen	Camosun College
Bruce Dunham	University of British Columbia—Statistics
Bevan Ferreira	Selkirk College
Claude Hurtubise	College of New Caledonia
Costa Karavas	Vancouver Community College
Kevin Keen	University of Northern BC
Colin Lawrence	BC Institute of Technology
Alex Liu	Kwantlen University College
Geoffrey Salloum	Camosun College
Ken Towson	Capilano College
Min Tsao	University of Victoria
Larry Weldon	Simon Fraser University—Statistics
Patricia Wrean	Camosun College
Julie Zhou	University of Victoria

**List of Participants (Professional Development Sessions (Mathematics)) – Thursday, May 18, 2006)**

<b>Name</b>	<b>Institution</b>	<b>Math for Elementary Ed (9 – 10:50)</b>	<b>Grad Student Talks (9 – 10:50)</b>	<b>Outreach Activities (11 – 11:50)</b>
Jim Bailey	College of the Rockies (Vice Chair)		X	X
Jill Britton	Camosun College	X		
Fae DeBeck	Thompson Rivers University	X		X
Richard DeMerchant	Ministry of Education	X		X
Malgorzata Dubiel	Simon Fraser University	X		X
Nora Franzova	Langara College	X		X
Mona Izumi	Northwest Community College	X		X
Clint Lee	Okanagan College	X		X
David Leeming	University of Victoria (Emeritus)		X	X
Wendy Lynn	Capilano College	X		X
Wayne Matthews	Camosun College	X		X
Dave Murray	Okanagan College	X		X
Susan Milner	University College of the Fraser Valley (Chair)	X		X
Leo Neufeld	Camosun College (Retired)	X		X
Michael Nyenhuis	Kwantlen University-College	X		X
Susan Oesterle	Douglas College (Secretary)	X		X
Wesley Snider	Douglas College			X
Tim Topper	Yukon College			X
Mahmoud Ziaei	Northern Lights College	X		X

## BC Secondary School Mathematics Contest 2006 Report to the BCCUPMS

On May 5, 2006 the Final Round of the BC Secondary School Mathematics Contest was written at 12 provincial colleges, university colleges, and universities. Students who had performed well on an earlier preliminary round held within their own high schools were invited (together with a teacher sponsor) to attend the final round and spend a day at the local college with several activities involved.

This year the participating colleges and university colleges were:

- Camosun College (Cam)
- Capilano College (Cap)
- College of New Caledonia (CNC)
- Douglas College (Doug)
- Langara College (Lang)
- Malaspina University College (MUC)
- North Island College (NIC)
- Northwest Community College (NWCC)
- Okanagan College/UBC Okanagan (OC/UBCO)
- Selkirk College (Sel)
- University College of the Cariboo (UCC)
- University College of the Fraser Valley (UCFV)

One significant feature of the contest this year is that the two post-secondary institutions in the Okanagan Region, Okanagan College and UBC Okanagan, entered into a partnership for the running of the contest. The cost of running the contest was shared between the two institutions. Members of the Mathematics Departments at both institutions were active in running the contest. This year the Final Round was held at UBC-O, but it will alternate between the institutions in future years.

The table below gives a summary of the number of students and the top scores (out of a possible 100) in the Final Round at each institution.

Institution	Final Round		Top Three Scores		Averages	
	Juniors	Seniors	Junior	Senior	Junior	Senior
Cam	15	18	73, 57, 55	63, 58, 42	46	35
Cap	30	22	89, 75, 69	88, 85, 78	42	48
CNC	34	13	58, 56, 52	61, 58, 47	N/A	N/A
Doug	21	18	78, 75, 72	67, 65, 62	51	46
Lang	17	11	73, 71, 62	78, 72, 59	40	47
MUC	35	33	57, 50, 48	76, 62, 57	30	34
NIC	10	10	43, 40, 32	50, 49, 37	30	38
NWCC	6	4	48, 39, 33	43, 31, 30	29	29
OC/UBCO	36	26	76, 50, 45	60, 55, 52	31	32
Sel	4	6	38, 32, 30	44, 41, 33	30	29
TRU	29	29	62, 60, 48	68, 68, 60	57	65
UCFV	50	25	68, 64, 57	71, 61, 48	31	36
<b>TOTAL</b>	<b>277</b>	<b>215</b>				

Approximately 1215 Juniors and 800 Seniors wrote the Preliminary Round this year. The top Junior Preliminary score was 60 and the top Senior Preliminary score was 60, both out of a possible 60. Note that not all schools report Preliminary Round scores or participation number. A total of 492 students participated in the Final Round this year.

The Preliminary Round is handled in essentially the same way at all institutions. The preliminary test papers are mailed to participating schools. The tests are administered and marked at the schools and the results, including the names of the Final Round participants, are transmitted to the hosting institution. The Final Round does have variations. At all institutions the Final Round contest was administered on the morning of May 5, with some type of activity provided for the sponsoring teachers, and, after the contest is completed, lunch is provided for all participants. After lunch the activities vary. Some institutions have talks for the participating students and teachers, others combine talks with other activities, such as a math relay, while others have more strenuous activities, such as basketball math. During the time that the afternoon activities take place, the tests are marked, and later in the afternoon prizes are awarded. The prizes vary among institutions. Some institutions give book prizes to all or selected participants; some institutions give cash prizes and/or scholarships to winners; many give T-shirts to all participants.

Thanks should go to those who have been involved in organizing their own college faculty to get on board, and have also been actively enlisting the local teachers to encourage involvement of their high schools. First there are the primary contacts at each of the Colleges: Wayne Matthews at Camosun College; Marsha Anderson at Capilano College; Nicholas at College of New Caledonia; Roger Coroas at Langara College; Patrick Ng at Malaspina University College; Slava Simice at North Island Community College; Mona Izumi at Northwest Community College; Clint Lee at Okanagan University College; Doug Henderson at Selkirk College; Susan Milner at University College of the Fraser Valley; and Fae Debeck at The University College of the Cariboo. Although these are the primary contacts at each institution, it goes without saying that they did NOT do all the work required to make this contest a success. Indeed, they have indicated that their entire departments were involved with hosting the contest. Special thanks should go to John Grant-McLoughlin of University of New Brunswick, who, as a professor in Mathematics Education, continues his involvement with our contest even though he is on the other side of the country and brings the rest of us back to reality regarding what we can reasonably expect high school students to be able to handle.

Furthermore, the problem posers who either submitted problems or came together at the Northwest Community College last May to put together the initial draft of all four contest papers are: Wayne Matthews (Cam), Jim Bailey (COTR), Judy Malcolm, Nicholas Buck and Edward Dobrowolski (CNC), Clint Lee and David Murray (OUC), Susan Milner (UCFV), Mona Izumi and Erfan Zahra'i (NWCC).

In addition, those who proof-read the contest are: Clint Lee (OC), John Siggers and Don Desbrisay (UCC), John Grant McLoughlin (UNB), Dave Murray (OC), Susan Milner (UCFV), and Nicholas Buck (CNC). The solutions were prepared and typeset by Jim Bailey (COTR), Norm Corbett (OC), and Clint Lee (OC). The final compilation and typesetting of the contest papers and solutions was done by Clint Lee, who also is responsible for distributing the contest materials to all of the participating post-secondary institutions.

My apologies to anyone whose name may have been inadvertently left out.

For those planning for next year, the dates I am suggesting for the 2007 contest are:

Preliminary Round:	Wednesday March 7, 2007
Final Round:	Thursday May 3, 2007 (note change from Friday to Thursday)

Respectfully submitted to the BCCUPMS on May 16, 2006 by

Clint Lee